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ABSTRACT

This paper reports on student reaction to the use of computer programs in political science courses during 1991-1995 at the University of Wisconsin-Eau Claire. The courses were junior-senior level courses, except for the honors section. Three types of software were used: (1) simulations; (2) Internet materials; and (3) data processing software which produced cross tabulation tables. Specific examples of the software are discussed with usages explained. A questionnaire was used to gather student reactions toward computer software. Students tended to be positive toward computer use. Charts, graphs, specific student comments, and a sample of the questionnaire are included in the paper. (EH)

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COMPUTER SOFTWARE IN THE UNDERGRADUATE POLITICAL SCIENCE CLASSROOM

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COMPUTER SOFTWARE IN THE UNDERGRADUATE POLITICAL SCIENCE CLASSROOM

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It is no longer unusual for political science undergraduate teachers to make use of computer technology in their teaching. Whether it is the use of word processing for faculty to more easily prepare teaching materials, as well as for students to write assignments, or for data processing in a more quantitatively oriented course, the technology is anything but unique. However, computers now make it possible to bring a much greater variety of computerized tools into the classroom. Simulations, electronic mail, on-line catalogues and the Internet are among the expanding teaching tools available to us. The challenge remains, though, to make use of technology so that it adds to the learning process rather than merely entertain a more computer literate student body.

At the same time, politics remains among the more conceptual and complex subjects to be studied at colleges and universities. Traditional written materials as well as class presentations and discussions can effectively bring students to understand political concepts and their complexities. But technology may also enhance learning about politics in a way that communicates effectively to the modern generation. Combined with the more traditional techniques, there is potential to further challenge undergraduate thinking about the political world.

For a number of years, my own teaching has included the traditional approaches, but has continually added various computerized techniques as attempts to add to the learning process. This research explores the impact of several technological elements that I have used in my teaching as perceived by students.

THE COURSES, THE SOFTWARE AND THE COMPUTING ENVIRONMENT

Between spring 1991 and spring 1995, student reactions to the use of computer programs in a number of political science courses were measured. Earlier research based in courses in 1991 and 1992 was presented at the 1992 Annual Meeting of the American Political Science Association and in an article in the Summer 1993 issue of the *Social Science Computer Review*.[1] This research adds to the earlier work with student reactions in courses over four additional semesters. The courses in which computer technology was used and in which student perceptions were measured from 1991-1995 include:

American National Politics - Honors Section.
Public Opinion and Political Behavior.
Political Parties, Elections and Voting.
The Presidency.

During this period student reactions to computer usage were measured once in the introductory course, three times in Political Parties, Elections and Voting, two times in Public Opinion and Political Behavior, and two times in The Presidency.

All but the American National Politics course were junior-senior level courses. Moreover, the intellectually sophisticated honors students in the introductory course performed at a junior-senior level.

Three types of software were used: simulations, Internet materials and data processing software which produced cross tabulation tables. All of the courses included both data processing and simulation programs. Internet materials were used the two times that The Presidency course was taught, in 1994 and 1995.

One of the simulations, *Political Campaigning*, was authored by Stephen Frantzich. The version used was part of the American Political Science Association's Poli-Ware program.[2] *Political Campaigning* is a role playing simulation in which the student makes strategic campaign decisions, with limited resources available, for an hypothetical congressional campaign. The program presents a political context which includes party identifications, presence or absence of an incumbent and available resources. The student, in turn, decides which party label to run under and makes strategic choices on such things as how partisan a campaign to run, whether to spend resources on voter registration and GOTV drives, what issue positions to adopt in the context of particular scenarios, what media strategies to use, the hiring of political professionals and whether to participate in debates. The student receives feedback on the outcome of the election and on how various decisions affected the outcome. This program was used in Political Parties, Elections and Voting and in the American National Politics honors class.

Presidential Policy making by R.T. Lewis is a simulation which presents the student with a series of situations which revolve around the staffing of the presidency and policy considerations. Five different scenarios are included on such things as organizing presidential staff, organizing for foreign policy decision making, strategy for a speech, press relations, and strategizing with staff for the long term. The student must choose among courses of action and receives feedback on the effect of each alternative. A bibliography is included. This program was used in The Presidency course.

The third simulation used in this study is *Presidential Campaign!* by G. David Garson. This is an elaborate decision making program in which the student must take a presidential candidate through a number of campaign stages over eight months, from April through November, with each month representing a different campaign stage. The student can play a presidential candidate in 1980, 1984 or 1988 in Version 1 as well as in 1992 in Version 2. The player is faced with decisions involving a large number of campaign scenarios. Several unanticipated types of events are interposed while many funding, media, polling, issue, campaign technique and other strategic decisions are made by the student. The student may record reasons for various decisions while there is frequent feedback based on electoral process literature. Bibliographic listings are also included. There is some graphical representation and a running electoral vote estimate as the student progresses through the simulation. Version 1 was used in 1991 and Version 2 in 1993 and 1994, all three times in the Parties course.

Presidential Policy making and the first edition of *Presidential Campaign!* were published through the National Collegiate Software Clearinghouse when it was associated with Duke University Press. The second edition of *Presidential Campaign!* was published by St. Martin's Press.[3]

One of the data processing programs, *Presidential Popularity* by Stephen Frantzich, was also a part of the Poli-Ware series cited above. This is an hypothesis testing exercise which has the student developing cross tabulation tables that compare a variety of political variables to different measures of presidential approval. The program involves the student in testing the relationship between public approval of the president and historical, partisanship, congressional box score, economic, and presidential activity variables. Measures of presidential popularity are used as both independent and dependent variables. The software was used in Public Opinion and Political Behavior, The Presidency and the introductory course.

Another data processing program is the venerable *Statistical Package for the Social Sciences*. At the University of Wisconsin-Eau Claire our students use the DEC-VAX mainframe package. However, it is well known that mainframe *SPSS* is complex and cumbersome with its syntax requirements. Consequently, several years ago programming personnel at the university developed a front end pre-processor to simplify two important sets of procedures: FREQUENCIES and CROSSTABS. The *SPSS Pre-Processor* directs students to make their entries one step at a time for identifying variables, ranges, recoding, frequencies and crosstabs statistics, and column, row and control variables. The pre-processor permits regular review of entries as a check for possible keying errors. However, errors involving such things as misnamed files or nonexistent variables do not show up until particular runs are completed and the printed output is produced. (The necessary retyping usually has produced unfortunate levels of frustration.) The pre-processor is, in effect, setting up a batch file for the student, then engaging *SPSS* for processing. This approach to *SPSS* was used in both the parties and public opinion courses.

The data sets used with SPSS varied some with these courses and the year taught. In the electoral politics course in 1991, the 1988 American National Election Study SETUPS program[4] was accessed while in the behavior course in 1991 and 1992 the *Political Socialization Across the Generations* SETUPS program[5] was accessed. Moreover, in the Behavior course the students developed research papers from the 1980-1990 American National Election Study Pre- and Post-Election data sets as did the Parties students in 1993 and 1994.[6]

Each SETUPS program is a subset of a well known data set that is available through the American Political Science Association and the Inter-University Consortium for Political and Social Research. The programs are accompanied by manuals which summarize the pertinent literature, take the student through a number of exercises to illustrate data analysis techniques and the particular data subsets, provide a codebook for the data subset, and assist the student in developing and testing hypotheses related to the data. The *Political Socialization Across the Generations* material was drawn from the ground breaking Jennings and Niemi political socialization project which studied parents and children in 1967 and 1973.[7] The *Voting Behavior: The 1988 Election* material was drawn from the 1988 American National Election Study which was produced by the Center for Political Studies at the University of Michigan, Ann Arbor.

For several years, this author provided each student using *SPSS* with a specially written manual which he developed for the pre-processor. The manual introduced the students to the type of data that could be accessed along with the CROSSTABS and FREQUENCIES procedures of *SPSS*. The manual also directed the students through the logon procedure and replicated each step to be used with the *SPSS Pre-Processor*. However, during the last two years minimal documentation was provided in class because the university developed extensive mainframe accessing documentation for students and a social science oriented computer lab permitted direct hands-on instruction on the SPSS Pre-Processor for several consecutive class sessions.

The third type of data processing program is the student version of *CHIPendale - Student Chip*.[8] This program was authored by Harvard Sociologist James Davis and further programmed by Ruth Bogaard of Zeta Data Systems. It produces cross tabulation tables, frequencies, simple graphics representations, Chi Square and standardized results. It does not produce any of the usual measures of association that political scientists associate with cross tabulated data, but does make use of control variables. *Chip* is designed to be an easy to learn and simple program that requires no statistical sophistication and involves students in directly examining data in tables.

Data sets need to be prepared for the *CHIPendale* format. It is possible to use either raw data or data

generated by *SPSS*. A *ToChip* utility simplifies transferring of *SPSS* processed data from files such as the American National Election Studies. The program creates small data files with normally four or five variables in each file. Consequently, the instructor would need to produce a large number of such files in order to cover a significant range of variables.[9] *Student Chip* was used in the Political Parties, Elections and Voting course in 1993 and 1994.

The final type of program that was used is Usenet News on the Internet. Students in the presidency course were taught the techniques of access in the lab setting and were especially directed to those news groups which posted the full panoply of White House documents processed through the Massachusetts Institute of Technology. The alt.news.media and alt.politics.org.misc groups were especially brought to the students' attention in part because it was more efficient for our computing system (compared to e-mail downloads) and partially because these groups also exposed the students to the "level" of discussion about politics on the open part of the Internet. In 1994 the students were asked to analyze a number of the "Reinventing Government" documents and in 1995 to analyze the relationship between the statements that the White House produced and how the print media covered them.

In all of the courses, students were asked to carry out the computer related assignments and relate their findings or experiences to their reading and class materials. Most of the time this was done through written assignments, including take-home examinations. The Internet assignments in The Presidency were analyzed through in-class oral reports by the students.[10] Examples of these assignments may be found in the appendix.

The computing environment for social science students at the University of Wisconsin-Eau Claire includes an MS-DOS/Windows laboratory which is networked to the VAX mainframe. The lab, with thirty DEC 486/50 stations stores most of the microcomputer programs while providing access to mainframe SPSS, e-mail and the Internet. The laboratory is located proximate to the Political Science faculty offices and two floors below the Sociology and Economics offices. The closeness to the Political Science department especially gives the students convenient access to our faculty.

Codebooks for the American National Election Studies are kept in the Political Science office area and the Reserve Library for security reasons. However, those placements do cause some inconvenience because the Codebooks are not in the computer lab.

THE MEASURING INSTRUMENT

The same questionnaire that was used for the 1992 study was used in the subsequent years. It was designed to measure student reactions to the computer experiences in comparison with other forms of learning. The purpose was especially to gain an understanding of how students perceived learning through the various computer tools compared to reading materials and traditional classroom activities. It was this author's belief that learning with computers would be seen by students as a legitimate and fruitful means to education and that learning this way would compare favorably with other sources of knowledge and means of presentation.

At the same time, I am not suggesting that reading and listening ought to be displaced. Much of the world's knowledge continues to reside in textual materials. This is likely to continue whether that text resides on a printed page or a computer disk. The exploration here concerns whether particular computer tools enhance an understanding of politics, not whether they displace one form of learning for another.

The time available for students to evaluate several different programs in each class necessitated a relatively brief set of questions. Ten items were developed which asked the students to provide their views on the ease of use and substantive value of the computer related work and to compare learning through the programs to other forms of learning used in the courses. A **strongly agree - agree - disagree - strongly disagree** continuum was used. Additional open-ended responses were invited by asking the students to indicate what they liked and disliked about any or all of the programs, but relatively few students availed themselves of this option. Of course, in each class the students applied the same ten questions to each simulation, program, or project. The questionnaire and a typical example of the instructions accompanying it may be found in Appendix A.

EVALUATION RESULTS

The student responses to the software tended to be quite positive. Most of the variation for each question ran between over two-thirds and over eighty percent strongly agreeing and agreeing that the

TABLE 1 - QUESTION 1

THE WRITTEN DOCUMENTATION WAS USEFUL FOR KNOWING WHAT DO.

Program Type and Program	Strongly Agree	Agree	Disagree	Strongly Disagree	Number
Data Processing:					
Chippendale - Student Chip	----%	58.8%	29.5%	11.8%	17
SPSS/With Pre-Processor	25.3	39.2	19.0	8.9	79
Presidential Popularity	29.4	52.9	15.3	1.2	85
Internet: Presidential Documents	43.8	46.9	6.3	----	32
Simulations:					
Presidential Policy making	34.1	53.7	9.8	2.4	41
Political Campaigning	20.6	50.0	23.5	2.9	34
Presidential Campaign!	35.3	26.5	32.4	2.9	34
Presidential Campaign!-1st ed	52.9	17.6	29.4	----	17
Presidential Campaign!-2d ed	17.6	35.3	35.3	5.9	17

software produced a beneficial experience. Similarly, the results showed approval of the documentation and use features as well.

There was little written documentation provided for most of the programs. The major exception was

for the data processed through the SPSS Pre-Processor. The SETUPS programs included extensive information about the data sets as did the code books for the American National Election Studies. Initially, this instructor provided a lengthy manual for accessing the VAX and navigating through the pre-processor. However, by 1993 the university provided significant documentation for the VAX and the pre-processor was simplified enough to be reasonably self guiding. In general, then, the students were provided with sufficient information and laboratory sessions to get started with each program, then have available on-screen guidance and faculty proximity for navigating.[1]

As Table 1 shows, two of the programs - *Student Chip* and Version 2 of *Presidential Campaign!* - reflect a substantial lack of useful written documentation in student eyes. *Chip*, however, may not really require much hard copy documentation because most found the on-screen instructions to be

TABLE 2 - QUESTION 2

THE ON-SCREEN INSTRUCTIONS WERE USEFUL FOR KNOWING WHAT DO DO.

Program Type and Program	Strongly Agree	Agree	Disagree	Strongly Disagree	Number
Data Processing:					
Chippendale - Student Chip	17.6%	70.6%	5.9%	5.9%	17
SPSS/With Pre-Processor	10.1	49.4	21.5	13.9	79
Presidential Popularity	31.8	55.3	9.4	2.4	85
Internet: Presidential Documents	31.3	53.1	15.6	----	32
Simulations:					
Presidential Policy making	46.3	51.2	2.4	----	41
Political Campaigning	35.3	58.8	2.9	----	34
Presidential Campaign!	52.9	26.5	14.7	2.9	34
Presidential Campaign!-1st ed	70.6	17.6	5.9	5.9	17
Presidential Campaign!-2d ed	17.6	35.3	35.3	5.9	17

quite acceptable. Overall, a majority of the students did find the hard copy documentation that was available to be useful, although the open-ended comments indicated that some wanted more details.

The computer world appears to increasingly encourage software which relies primarily on hypertext type help screens instead of written documentation. As one browses through the computer press, it is common to see software advertising and reviews which emphasize such ease of use that one need not even "crack open" a manual to use the program. While the programs used in this study DO not approach the hypertext help screens common to Windows and Mac programs, they DO provide a

degree of on-line help. Certainly the simulations and the pre-processor attempt to be largely self-guiding and all the programs reveal an absence of any significant graphical enhancements.

Table 2 shows that a substantial majority of the students found the on-screen instructions to be useful for guidance through most of the programs. Except for the *SPSS Pre-Processor* and version two of *Presidential Campaign!*, well over 80 percent of the students found the on-screen instructions to be useful. More than one-third of the students who used the pre-processor, though, found that the on-screen guidance was not useful. In discussions with a number of these students, it appears that it

TABLE 3 - QUESTION 3

THE SOFTWARE WAS EASY TO USE.

Program Type and Program	Strongly Agree	Agree	Disagree	Strongly Disagree	Number
Data Processing:					
Chippendale - Student Chip	23.5%	35.3%	29.4%	11.8%	17
SPSS/With Pre-Processor	5.1	41.8	29.1	16.5	79
Presidential Popularity	27.1	54.1	14.1	3.5	85
Internet: Presidential Documents	31.3	62.5	6.3	----	32
Simulations:					
Presidential Policy making	48.8	46.3	4.9	----	41
Political Campaigning	55.9	35.3	----	5.9	34
Presidential Campaign!	44.1	35.3	14.7	2.9	34
Presidential Campaign!-1st ed	64.7	23.5	11.8	----	17
Presidential Campaign!-2d ed	23.5	47.1	17.6	5.9	17

was more the *SPSS* syntax and statistical terminology that was included in the pre-processor which produced a degree of discomfort rather than the program itself. This perhaps says more about the advance preparation of these students for quantitative analysis than it does about the program.[12]

The 41.2 percent of the students who used the second edition of *Presidential Campaign!* and found that the on-screen instructions were not useful was unexpected after the positive evaluation of these kinds of instructions for Version 1. Perhaps it was that the assignments for the second edition of the simulation required the exercise of more options than previously, thus making the navigation of the configuration screens more complex. Moreover, given the penchant for last minute work on projects by some students, the intricacies of the on-screen choices left seven of the seventeen students involved somewhat frustrated. Nevertheless, and perhaps somewhat contradictorily, Table 3 shows

that over 70 percent of the students using Version 2 found the software easy to use.

Indeed, the larger percentage of students who found that any of the software was not easy to use did so for two of the data processing programs: *Student Chip* and *SPSS* through its pre-processor. The emphasis on quantitative analysis and a more intricate series of steps for identifying independent, dependent and control variables contributed to this perception. They had to work with more elaborate variable listings either on-screen or in large codebooks. Compounding student reactions to *SPSS* were frequent equipment problems. The nearest page printer to the social science computer

TABLE 4 - QUESTION 4

The software contributed to my knowledge of an aspect of politics.

Program Type and Program	Strongly Agree	Agree	Disagree	Strongly Disagree	Number
Data Processing:					
Chippendale - Student Chip	17.6%	76.5%	5.9%	----%	17
SPSS/With Pre-Processor	17.7	59.5	12.7	2.5	79
Presidential Popularity	22.4	55.3	21.2	----	85
Internet: Presidential Documents	34.4	59.4	6.3	----	32
Simulations:					
Presidential Policy making	34.1	58.5	7.3	----	41
Political Campaigning	32.4	55.9	8.8	----	34
Presidential Campaign!	50.0	35.3	5.9	----	34
Presidential Campaign!-1st ed	82.4	11.8	5.9	----	17
Presidential Campaign!-2d ed	29.4	58.8	5.9	----	17

laboratory was one floor down and that printer was often out-of-service. Frequently students would have to go to the library building to retrieve mainframe output, or they could work at terminals there but be some distance from faculty who could help with syntax and other technical problems. Further complicating equipment failure was the way errors are handled when *SPSS* is batch processing. That means moving from computers to distant printers and back to the computers to redo runs when errors are committed.[13]

CHIPendale is designed for ease of use. Indeed, the instructional sessions went rather efficiently in the lab as the instructor is easily able to move about the room to observe student progress. It appears, though, that the grouping of varia' les in small data files of about five variables each created

the need for more maneuvering through the software in order to develop runs than the students preferred.

For the remaining software, more than 70 percent of the students found the programs easy to use. This is certainly important for liberal arts students who have had little exposure to computing beyond games and rudimentary word processing.

Whether any educational tool is easy and fun or difficult and stressful is secondary to whether students learn with the tool. In this study, the students' own sense of whether they learned something about politics through the software was measured. It is clear in Table 4 that whatever difficulty some of the students may have had with documentation and ease of use, they overwhelmingly believed that they learned through the use of the software. No fewer than 77

TABLE 5 - QUESTION 5

THE WRITTEN/ORAL ASSIGNMENT(S) CONTRIBUTED TO MY UNDERSTANDING OF THE MATERIAL.

Program Type and Program	Strongly Agree	Agree	Disagree	Strongly Disagree	Number
Data Processing:					
Chippendale - Student Chip	11.8%	70.6%	17.6%	----%	17
SPSS/With Pre-Processor	16.5	51.9	20.3	2.5	79
Presidential Popularity	23.5	50.6	24.7	----	85
Internet: Presidential Documents	34.4	53.1	12.5	----	32
Simulations:					
Presidential Policy making	26.8	61.0	9.8	2.4	41
Political Campaigning	26.5	67.6	2.9	----	34
Presidential Campaign!	29.4	55.9	8.8	2.9	34
Presidential Campaign!-1st ed	47.1	52.9	----	----	17
Presidential Campaign!-2d ed	11.8	58.8	17.6	5.9	17

percent of the students felt that the programs which they used contributed to their knowledge about politics. Students certainly believe that they have learned through these tools and that alone is an important factor for motivating them.

I would add my own sense that the combination of data processing, "live" presidential documents or simulations with substantive readings and classroom materials created an integrated learning environ-

ment that enhanced an understanding of political phenomena. In closely observing each class, it was clear that during lab sessions levels of concentration and attention greatly deepened. It was also clear that the students worked through the full length of the sessions even during those times when they could have left and returned at a later time to practice with the software.

Another, but undocumented, feature of the teaching and laboratory environment involved the use of e-mail. I was readily reachable by e-mail so that students could send messages any time of day or night and not play telephone tag. This instructor's frequent availability through e-mail helped immensely to guide students through many of their problems.

TABLE 6 - QUESTION 6

THE SOFTWARE CONTRIBUTED TO MY UNDERSTANDING OF THE TEXTBOOKS.

Program Type and Program	Strongly Agree	Agree	Disagree	Strongly Disagree	Number
Data Processing:					
Chippendale - Student Chip	----%	76.5%	23.5%	----%	17
SPSS/With Pre-Processor	10.1	44.3	35.4	2.5	79
Presidential Popularity	15.3	51.8	27.1	4.7	85
Internet: Presidential Documents	18.8	56.3	25.0	----	32
Simulations:					
Presidential Policy making	17.1	58.5	19.5	2.4	41
Political Campaigning	14.7	58.8	20.6	2.9	34
Presidential Campaign!	32.4	47.1	17.6	----	34
Presidential Campaign!-1st ed	58.8	29.4	11.8	----	17
Presidential Campaign!-2d ed	5.9	64.7	23.5	----	17

It was my consistent practice to require written and/or oral reports for analyzing the political content of the software. Often the students would also be asked to compare the patterns that they found through the software to relevant findings in particular pieces of political science literature. This was designed both to have the students generate information for analysis themselves and to explore others' analyses. Table 5 shows that these kinds of assignments met with success in the students' eyes. At least two-thirds of the students said that the written and/or oral assignments based on the software enhanced their understanding of the material that they were working with in the course. Indeed, in most instances it was well over 70 percent of the students feeling this way.
A caveat is in order though. While the students themselves expressed a belief that their assignments based on the software enhanced their understanding of course materials, it was also clear that the

material actually turned in often did not reflect a systematic application of findings through software to reading or class materials. Some of the students may have had a sense of a connection, but often did not succeed in demonstrating that connection in graded assignments.

The data in Tables 6 and 7 attempt to gauge an interconnection between the software and the reading materials for the course. A majority of the students did sense a degree of cross fertilization with the percentages quite pronounced for the simulations and the Internet work. They tended to find less connection between the texts and the data processing software, especially in terms of the readings

TABLE 7 - QUESTION 7

THE TEXTBOOKS CONTRIBUTED TO MY UNDERSTANDING OF THE SOFTWARE.

Program Type and Program	Strongly Agree	Agree	Disagree	Strongly Disagree	Number
Data Processing:					
Chippendale - Student Chip	----%	52.9%	41.2%	5.9%	17
SPSS/With Pre-Processor	13.9	38.0	35.4	5.1	79
Presidential Popularity	12.9	47.1	36.5	2.4	85
Internet: Presidential Documents	15.6	50.0	28.1	3.1	32
Simulations:					
Presidential Policy making	24.4	58.5	17.1	----	41
Political Campaigning	11.8	61.8	17.6	5.9	34
Presidential Campaign!	32.4	50.0	14.7	----	34
Presidential Campaign!-1st ed	47.1	41.2	11.8	----	17
Presidential Campaign!-2d ed	17.6	58.8	17.6	----	17

contributing to an understanding of the software. Barely half found the readings contributing to an understanding of the *Chip* and *SPSS* data and just 60 percent found such with *Presidential Popularity*. However, the obvious needs to be stated. None of the reading materials were designed to shed light on particular pieces of software while part of this instructor's intention was to use the software to help illuminate aspects of the readings. Here an overwhelming majority of students said that most of the software contributed to their understanding of the texts. That was somewhat less so only for two of the data processing programs, *SPSS* with the pre-processor and *Presidential Popularity*.

The study also attempted to measure an interconnection between the software and class materials that were developed through discussions and lectures. Not surprisingly, the students both saw an inter-

connection and felt that they gained an understanding in both directions. Tables 8 and 9 show that very substantial majorities of the students felt that the software contributed to their understanding of class work and that the lectures and discussions contributed to their understanding of what the software was producing. Again, this was somewhat less so for two of the data processing pieces, *SPSS* and *Presidential Popularity*, but even with these two programs at least 65 percent gained some understanding of the data and class materials. Clearly, the emphasis given to the software in class is reflected in the students' reactions to the two questions reflected in Tables 8 and 9.

TABLE 8 - QUESTION 8

THE SOFTWARE CONTRIBUTED TO MY UNDERSTANDING OF CLASS DISCUSSIONS AND LECTURES.

Program Type and Program	Strongly Agree	Agree	Disagree	Strongly Disagree	Number
Data Processing:					
Chippendale - Student Chip	23.5%	58.8%	17.6%	----%	17
SPSS/With Pre-Processor	15.2	51.9	24.1	10.1	79
Presidential Popularity	11.8	57.6	27.1	2.4	85
Internet: Presidential Documents	25.0	53.1	18.8	3.1	32
Simulations:					
Presidential Policy making	24.4	63.4	12.2	----	41
Political Campaigning	17.6	67.6	11.8	----	34
Presidential Campaign!	29.4	50.0	17.6	----	34
Presidential Campaign!-1st ed	52.9	35.3	11.8	----	17
Presidential Campaign!-2d ed	5.9	64.7	23.5	----	17

Finally, the students were asked their overall impressions of the use of software as a technique for learning about politics. The response was overwhelmingly positive. In Table 10 we can see that the range is from 64.5 and 70.6 percent saying that *SPSS* with the pre-processor and Version 2 of *Presidential Campaign!*, respectively, are good techniques to 80 percent or more saying so for all of the other programs. The use of software directly in the teaching process was clearly received well by a substantial majority of the students involved in this study.

The questionnaires also asked the students to comment on what they liked and disliked about the software. The positive types of reactions to teaching with software are reflected in some of these open-ended responses:

I really enjoyed the computerized analysis that was used in the class. It was a very innovative way to learn about different aspects of politics. I think more time should have been spent working with the different programs available. (A student in The Presidency.)

TABLE 9 - QUESTION 9

CLASS DISCUSSIONS AND LECTURES CONTRIBUTED TO MY UNDERSTANDING OF THE SOFTWARE.

Program Type and Program	Strongly Agree	Agree	Disagree	Strongly Disagree	Number
Data Processing:					
Chippendale - Student Chip	23.5%	70.6%	5.9%	----%	17
SPSS/With Pre-Processor	20.3	45.6	21.5	3.8	79
Presidential Popularity	21.2	51.8	22.4	3.5	85
Internet: Presidential Documents	25.0	53.1	18.8	----	32
Simulations:					
Presidential Policy making	29.3	58.5	12.2	----	41
Political Campaigning	29.4	61.8	5.9	----	34
Presidential Campaign!	38.2	47.1	11.8	----	34
Presidential Campaign!-1st ed	41.2	47.1	11.8	----	17
Presidential Campaign!-2d ed	35.3	47.1	11.8	----	17

The programs available to us are excellent learning tools and enhance the text, classroom work and research. (A student in The Presidency.)

I enjoyed using the *Presidential Policy making* software. It was interesting to be faced with options on how to answer questions that are asked of the president. (A student in The Presidency.)

I had some trouble getting around on the Internet program. I learned a great deal from the work we did with them, though. I think it's a helpful and interesting addition to the classroom lectures. (A student in The Presidency.)

Presidential Campaign! was wonderful. I thought it very challenging and learned a great deal. (A student in Political Parties, Elections and Voting.)

ANES92 (1992 American National Election Study) is a very useful piece of software - easy to

use and understand. (A student in Political Parties, Elections and Voting.)

Chip was easy to use and the data was clear and easy to interpret. Both the political and presidential campaigns were beneficial in that they were fairly realistic and allowed you to gain knowledge through the experience of running your own campaigns. (A student in Political Parties, Elections and Voting.)

TABLE 10 - QUESTION 10

THIS SOFTWARE WAS A GOOD ALTERNATIVE TECHNIQUE FOR LEARNING ABOUT POLITICS.

Program Type and Program	Strongly Agree	Agree	Disagree	Strongly Disagree	Number
Data Processing:					
Chippendale - Student Chip	17.6%	70.6%	11.8%	----%	17
SPSS/With Pre-Processor	25.3	39.2	21.5	6.3	79
Presidential Popularity	31.8	48.2	15.3	3.5	85
Internet: Presidential Documents	59.4	34.4	6.3	----	32
Simulations:					
Presidential Policy making	48.8	36.6	12.2	----	41
Political Campaigning	61.8	26.5	8.8	----	34
Presidential Campaign!	61.8	20.6	11.8	2.9	34
Presidential Campaign!-1st ed	82.4	11.8	5.9	----	17
Presidential Campaign!-2d ed	41.2	29.4	17.6	5.9	17

I thought the *Chip* and the simulations were very useful and I didn't run into that many problems with those pieces of software. However, the pre-processor I found to be quite a hassle. (A student in Political Parties, Elections and Voting.)

Chip: easy to use, once you understand how to use it. Fast tool to get information about a subject (bigger library and better information on each file would be nice). (A student in Political Parties, Elections and Voting.)

The research software assignments were excellent supplements. Instructions were meticulously laid out and the material was extremely relevant. Also, the manner in which the activities were incorporated into the class material brought added relevance to the material. (A student in Public Opinion and Political Behavior.)

Other open-ended responses indicated some of the difficulties that a minority of the students had:

> The *SPSS Pre-Processor* was very difficult for me. It was hard to get into, print-outs were slow, inconvenient to always have to run back and forth from codebooks in Polisci office and computer screen for all info; difficult to set up tables. But, all in all, the programs were very useful, and helped a lot in most cases. (A student in Political Parties, Elections and Voting.)

> *Chip* was difficult to remember how to get into, but easy to figure out once you get in. (A student in Political Parties, Elections and Voting.)

> *Presidential Campaign!* was fun, easy to learn from, difficult to change variables at beginning (number of decisions and such), more choices/more realistic than *Political Campaigning*. (A student in Political Parties, Elections and Voting.)

> The projects contained too many tables. At first I didn't quite understand how to read them. (A student in Political Parties, Elections and Voting.)

> With *Presidential Popularity*, explain what the numbers mean. I am still at a loss to explain them. Maybe a crash course in statistical analysis is warranted. (A student in The Presidency.)

> I really liked using these programs but the only problem I had with them was that the choices were usually over simplified. I think it needs to be an emphasis on how most of the decision making is not clear-cut. (A student in The Presidency.)

CONCLUSIONS

Teaching about politics through computer programs is clearly a valid approach to undergraduate political science education. Computer programs provide instructors with many additional tools with which to try to stimulate students. Many are received with a good deal of enthusiasm by the students. But each type of program needs to be used for purposes appropriate to both the program and the course.

Good simulations help to approximate real life situations in which the student can role-play. They can be especially strong in illustrating processes within political institutions as well as the interaction of actors in the processes with citizens. However, technological and knowledge limits should caution us to recognize that only a finite number of variables can be programmed into a computer simulation. Among the simulations used for this study, *Presidential Campaign!*, Version 2, stands out as an effective example of how to involve students in an intellectual activity which provides a reasonably realistic feel for an important aspect of American politics.

The Internet offers a rapidly expanding universe of resources for students. Whether seeking official documents, high and low level discussions, or just plain news, the Internet opens up the student to a broad range of current political phenomena that can be beneficially discussed and analyzed. The Internet, especially with the World Wide Web explosion, is too vast to identify just one or two most important activities. Explore the American Political Science Association, Northwestern University and Rice University Gopher sites to begin to experience the vast resources available. Explore some of the Usenet news groups and well as subscription "listserve" groups for useful resources for students. In this study, the use of the Internet to gain access to White House documents was an invalu-

able resource for a course on the presidency. Other resources can be sought out for many other kinds of courses.

Data analysis based on empirically sound techniques remains an important activity for political science students. However, there remains the dilemma over whether to involve students with the major statistical package that political scientists use or involve them with much more simple programs that get them directly to analysis of the data instead of programmatic syntax. *CHIPendale* minimizes statistical manipulation in order to directly expose students to data analysis in a relatively painless way. However, the lack of even some measures of association make it most suitable as an early introduction to political and social data analysis for freshman and sophomores.

Presidential Popularity provides cross tabulation tables and some related statistics, but for a limited and old data set. An updated set of data would continue to make the program suitable for courses on the presidency and public opinion.

Then there is *SPSS*. Mainframe versions of this program are too complex for undergraduate courses which are not primarily methodology or statistics courses. Even the interactive mode involves a high quantity of syntax knowledge which diverts students from the meaning of the data. The front end pre-processor which is used at the University of Wisconsin-Eau Claire is severely hampered by a mainframe environment which lends itself to jargon, too much complexity and equipment failures. The Windows and MacIntosh versions, while not a part of this study, appear to offer a much more user-friendly interface which can familiarize undergraduates with an important program while minimizing the syntactical complexities. Or perhaps a simplified statistical approach such as the one from MicroCase is more important for undergraduates to learn some statistical analysis, thus leaving *SPSS* to the graduate level.[14]

All of the programs analyzed were used in a text-based environment with the PC software running under MS-DOS. All could be visually and analytically enhanced through development for the Windows and MacIntosh graphical user interface environments. These environments offer more than just visual pizazz. They would permit such easier variable manipulation and more effective hypertext type features.

Finally, there is a software development that was not a part of this study, but which represents great potential for political science instruction. I speak of multi-media approaches which can incorporate text, graphics, voice and visual motion on the computer. A program such as *Capitol Hill*[15], reported on separately on this panel[16] and recently reviewed in the *Social Science Computer Review*, is an example of that potential. It is a simulation that is impressive "in its graphics and general design," but is weak "in presenting issues on which bills are based, on the committee steps by which a bill becomes a law, and on campaigning for office." SSCORE concludes that the software developer neglected to include a political scientist's knowledge on what should be a part of such a simulation.[17] Nevertheless, the multi-media interplay hints at the techniques that can intensify student learning in the modern age. In short, a well done multi-media version of something like *Presidential Campaign!* would be the kind of program that would excite and stimulate.

It appears that political scientists should be beyond having to decide whether the integration of computer programs into our course work is viable. The issue now is which software is appropriate and what kinds of software need to be developed. This study confirms that there are a variety of viable computer tools that would be appropriate in a political science laboratory setting. Student reactions and the solid political science foundation of the programs used in this study help to produce that confirmation.[18]

APPENDIX A

POLITICAL SCIENCE 341
POLITICAL PARTIES, ELECTIONS AND VOTING

EVALUATIONS OF COMPUTER SOFTWARE INCLUDING STUDENT CHIP

FALL 1994

Student CHIP, two computer simulations and the SPSS Pre-Processor for the 1992 American National Election Study were used during the semester. It is important to know how you, the student, reacted to each software set. Following are a series of questions related to each one and which can be answered on the Opscan Form that is provided. There also is space for your open-ended comments. Your candid responses will be most helpful to myself and to other political scientists who are using computerized materials in political science courses.

On the Opscan form, please fill in the top portion as follows:

Instructor:	M. Sipress
Dept.:	Pols
Course:	341
Section:	01
Date:	December 14, 1994
Last Name:	SOFTWARE

Please fill in your responses for each closed-ended statement as follows:

A Strongly Agree
B Agree
C Disagree
D Strongly Disagree

In addition to the closed ended responses, please write your open-ended comments concerning what you liked and disliked about any or all of the programs on the back of the questionnaire.

THE SOFTWARE EVALUATION QUESTIONNAIRE
POLITICAL SCIENCE 341
POLITICAL PARTIES, ELECTIONS AND VOTING
UNIVERSITY OF WISCONSIN-EAU CLAIRE
FALL, 1994

We worked with 4 programs across the semester for which there are 10 types of judgements that you are asked to make about each one. Below is the list of 10 statements to be applied to each program.

1. The written documentation was useful for knowing what to DO.
2. The on-screen instructions were useful for knowing what to DO.
3. The software was easy to use.
4. The software contributed to my knowledge of an aspect of politics.
5. The written/oral assignment(s) contributed to my understanding of the material.
6. The software contributed to my understanding of the textbooks.
7. The textbooks contributed to my understanding of the software.
8. The software contributed to my understanding of class discussions and lectures.
9. Class discussions and lectures contributed to my understanding of the software.
10. This software was a good alternative technique for learning about politics.

The *CHIP* program should be evaluated on the first 10 Opscan items, *POLITICAL CAMPAIGNING* (the Congressional Campaign) on 11 through 20, *PRESIDENTIAL CAMPAIGN!* on 21 through 30, and the *SPSS PRE-PROCESSOR* on items 31-40. In other words, follow the above statements in sequence for each simulation and data set. Therefore, fill in the Opscan form as follows:

STUDENT CHIP - Opscan items 1-10.
POLITICAL CAMPAIGNING (congressional campaign) - Opscan items 11-20.
PRESIDENTIAL CAMPAIGN! - Opscan items 21-30.
AMERICAN NATIONAL ELECTION STUDY FILES with SPSS PRE-PROCESSOR - Opscan items 31-40.

Again, **please use the back of this questionnaire to indicate what you liked and disliked about each piece of software**. Thank you very much.

Prof. Sipress

APPENDIX B

THE PRESIDENCY

POLITICAL SCIENCE 348
Spring 1995

PRESIDENTIAL POLICY MAKING SIMULATION
ORAL REPORT ASSIGNMENT

You have had some time to learn how to use the *Presidential Policy making* simulation. We will now work in teams to prepare oral reports for presentation in class. Each team will divide its report to answer the following questions:

1. How DO the courses of action and situations in the simulation compare to course reading materials in roughly comparable situations?

2. Which courses of action and situations explain the Clinton Administration actions? Explain why.

Each team will work with one of the situations/questions laid out in the simulation and its documentation. Also, to report on the Clinton Administration you will need to use sources such as *Congressional Quarterly Weekly Report*. *The New York Times* and/or other good daily newspapers could also be used. The weekly magazines are inadequate, but the *Washington Post National Weekly* and *National Journal* are good and legitimate weekly sources. Start with *Congressional Quarterly* and go to other sources only if you need more or desire to go to more. With any news source, keep in mind that you need to work with the hard news stories, not the editorials and columns. Editorials and columns are opinion pieces which are not necessarily supported by facts.

Each member of the team must participate in the preparation and delivery of the team's oral report. The situation, members and date of report for each team follows:

Question/Situation 1: (3 students, names deleted) - April 24, 1995.

Question/Situation 2: (3 students, names deleted) - April 26, 1995.

Question/Situation 3: (3 students, names deleted) - May 1, 1995.

Question/Situation 4: (3 students, names deleted) - May 3, 1995.

Question/Situation 5: (2 students, names deleted) - May 8, 1995.

Please meet your responsibilities to work together so that other members of your team are not disadvantaged.

APPENDIX C

POLITICAL SCIENCE 341
POLITICAL PARTIES, ELECTIONS AND VOTING
UNIVERSITY OF WISCONSIN-EAU CLAIRE

FINAL EXAM **FALL, 1994**

We have discussed, read and processed data on voting behavior in the United States. This final assignment is designed to bring the various materials together into a coherent framework for understanding voting behavior. To DO so, it will be important for you to bring together the personal and situational factors that affect voter turnout as well as the various factors that cause Americans to vote the way they DO.

First, using CHIP, develop five cross tabulation tables involving **demographic** variables and whether one votes in Presidential elections. Then, also using CHIP and the **same** demographic variables, develop five cross tabulation tables with how people voted for President (Democrat or Republican). Using the resulting data, explain whether the demographic variables influence how one votes to the same extent that they impact on voter turnout.

Next, using the 1992 American National Election Study (ANES92), develop cross tabulation tables for at least five **non**-demographic variables which you feel influence the way people vote for President. Included must be:

Summary Party Identification.
At least two candidate characteristics/image variables.
At least two issue variables.

Using the resulting data, explain the extent to which these three types of variables influence the way people vote.

Finally, compare and contrast your findings on **both** voter turnout and why Americans vote as they DO for President based on class discussion **and** the relevant reading materials. Using the class **and** reading materials, are the voting patterns for other offices, e.g. Congress, different from the voting patterns for President (in terms of turnout and which candidates Americans vote for)? **Make sure that you demonstrate a full understanding of the reading material. A few choice quotes or paraphrases will NOT be sufficient.** That means including thought out and clearly expressed summaries.

Your assignment must be legible, written in good grammatical English and with correct spelling. Appropriate citations and the tables that you ran must also be included. Any standard form of citation will be acceptable. Your assignment should be between 750 and 2000 words, exclusive of tables. It is due by 4 PM, Thursday, December 22, 1994. It may be slipped under my office door, placed in my mail box, or handed directly to me. Make sure that you keep a duplicate copy.

APPENDIX D

POLITICAL SCIENCE 341
POLITICAL PARTIES, ELECTIONS AND VOTING

Campaign Simulations
Take-Home Assignment

Prof. Mort Sipress
Fall 1994

Play the **Presidential Campaign!** simulation at least four times and the **Political Campaigning** simulation at least four times. You may want to DO practice runs with both so as to familiarize yourself with what is involved. Follow the on-line instructions as well as those from class. (It is important to review the written instructions, the on-screen instructions and/or the help screens before starting the programs.)

With **Presidential Campaign!** you must attend to the following:

1. Follow carefully the initial instructions, including entering the sign-on information called for.

2. Using the "tool bar" across the top of the screen, go into "selections" and make any changes that will assist you in carrying out the assignment.

3. Then go into "configuration." To DO so, you will need the password which unimaginatively is "password" in lower case letters. You may then need to revise one or more of the parameters.

4. You will simulate a campaign at least once for each of the possible years (1980, 1984, 1988 and 1992). You may also want to revise other parameters to produce information that you would like copied to the floppy disk in drive A.

5. Review the "utilities" section to see if any changes there would provide you with helpful information.

6. Launch the program, making at least three decisions per month for each year.

Again, each simulation must be run at least 4 times and you must make at **least three decisions per month** in *Presidential Campaign!* Keep careful records of your strategies and the results of each decision so that you will have a basis for a written analysis.

After having gone through the two different campaign simulations the requisite number of times, explain in writing how each simulation did and did not illustrate the elements of a campaign. Using class, text (*Wayne* and *Salmore)* and simulation materials on the nature of election campaigns, explain which simulation provided a more realistic picture of a campaign experience. Also explain what strategies by you and your opponent seemed to work best and seemed to not work well. What general conclusions can you draw from the simulations about what kinds of things affect the outcome of American election campaigns?

This paper should be between 500 and 1500 words.

It is due by class time, November 2, 1994. It can be typewritten, printed from a word processor, or legibly handwritten. Make sure that it is written in good grammatical English with correct spelling. Poor writing and poor spelling will affect your grade. Therefore, proof read, correct and rewrite before turning it in.

Make a duplicate copy for yourself. If you DO use a campus printer, use a bold, double strike, or near letter quality font so that the print will be dark enough for me to read. Illegible or otherwise unreadable papers will be returned for redoing.

ENDNOTES

1. Morton Sipress, "Simulations as Teaching Devices," a paper presented at the 1992 Annual Meeting of the American Political Science Association, Chicago, Illinois; and Morton Sipress, "Evaluations of Simulations Used in Teaching Political Science," *Social Science Computer Review*, Vol. 11, No. 2 (Summer, 1993), pp. 214-225.

2. Steven Frantzich's software (*Political Campaigning* and *Presidential Popularity* in this study) is part of the Poli-Ware Series, Political Science Software, published by the American Political Science Association, and distributed by The Academic Software Library. A new version of *Political Campaigning* has recently been released under the auspices of Brown and Benchmark Publishers, Madison, Wisconsin, as well as the Poli-Ware program, but has not yet been used in this writer's courses. Both of these are MS-DOS programs which may be run from floppy disks.

3. G. David Garson, *Presidential Campaign!*, first edition, and R.T. Lewis, *Presidential Policy making* (Chapel Hill: National Collegiate Software of Duke University Press, 1989); G. David Garson, *Presidential Campaign!*, second edition (New York: St. Martin's Press, 1993). These are MS-DOS programs which may be run from floppy disks.

4. Charles Prysby and Carmine Scavo, *Voting Behavior: The 1988 Election* (Washington, DC: American Political Science Association, 1989). *Voting Behavior: The 1992 Election* (Washington, DC: American Political Science Association, 1993) is also available. However, classes involved with this study moved to the full *American National Election Studies* data sets in 1993.

5. Paul Allen Beck, Jere W. Bruner, and L. Douglas Dobson, *Political Socialization Across the Generations* (Washington, DC: American Political Science Association, 1975).

6. The *American National Election Study* data sets are based on the University of Michigan's Center for Political Studies biennial national election surveys and are provided by the Inter-University Consortium for Political and Social Research, Ann Arbor, Michigan. The ICPSR is not responsible for the interpretations of the data provided by it.

7. M. Kent Jennings and Richard G. Niemi, *The Youth-Parent Socialization Panel Study, 1965-1973* (Ann Arbor: Center for Political Studies, University of Michigan, 1973). The full Jennings-Niemi data set is available through the Inter-University Consortium for Political and Social Research. In addition, a 1981 follow-up data set has become available from the ICPSR.

8. James A. Davis, *CHIPendale* (Hanover, NH: Zeta Data, 1992). This is an MS-DOS program which can be run from a floppy.

9. There is a sizeable community of sociologists and political scientists who have developed data sets for *CHIPendale* and who readily share their data with others. The political scientist who has developed an especially large number of data sets is Jere W. Bruner at Oberlin College in Oberlin, Ohio.

10. There also were assignments in the Parties and Presidency courses which the students sent via e-mail. Comments and grades were inserted into the student messages and e-mailed back to them. The effect of this technique was not measured because as the instructor, I found it to be a much more time consuming way of placing comments in and grading material. A combination of having to take the time to manipulate a document in VAX e-mail plus seeing only one screen at a time, made the assignment much more tedious for the grading purposes than working with hard copy. I discontinued the practice although I continue to strongly encourage e-mail as a good way of engaging in discussion with me.

11. Version 2 of *Presidential Campaign!* did have available a booklet for purchase by the students, but it was my judgement that the cost far exceeded the value of that particular documentation. Our license to use the program was tied to textbook adoption from St. Martins Press, but permission to reprint the documentation was not included.

12. Political Science majors at the University of Wisconsin-Eau Claire are urged to enroll in a sophomore level methods course before taking any junior-senior level courses. However, many put the course off until their later years and wind up taking courses involving some data analysis prior to the course work which would prepare them for the data. Stronger advising and additional sections of the methods course will hopefully remedy this problem.

13. *SPSS for Windows* would simplify students' work and still expose them to the premiere statistical package in the social sciences, but budgetary constraints preclude this for the time being.

14. Two packages from MicroCase worth exploring for course use are *American Government: An Introduction Using Microcase*, 3rd ed. (Bellevue, WA: MicroCase Corporation, 1995) and Michael Corbett, *Research Methods in Political Science: An Introduction Using MicroCase* (Bellevue, WA: MicroCase Corporation, 1993). Corbett has also produced a Poli-Ware program, *Selected Introductory Topics in Political Science Research Methods*. All are MS-DOS packages which can be run from a hard disk or floppies.

15. *Capitol Hill* (Novato, CA: Amazing Media/The Software Toolworks (1993). CD-ROM for Windows and MacIntosh.

16. Cynthia Opheim and Willard Stouffer, "Using *Capitol Hill* CD-ROM to Teach Undergraduate Political Science Courses," a paper presented at the 1995 Annual Meeting of the American Political Science Association, Chicago, Illinois.

17. Staff Review, *Social Science Computer Review*, Vol. 13, No. 1 (Spring 1995), pp. 94-95.

18. There is the obstacle of funding. High quality software development that would take advantage of multi-media capabilities is expensive. Outfitting university computer laboratories with the necessary multi-media equipment is expensive. Yet, it is important for political science and the other social sciences to try to assure an adequate share of the computing resources being developed at most colleges and universities. How this can be done, though, is beyond the scope of this paper.